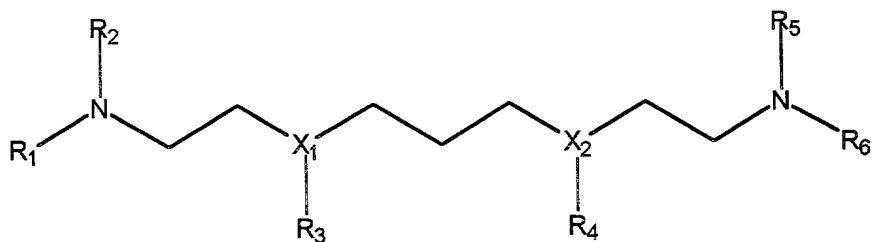


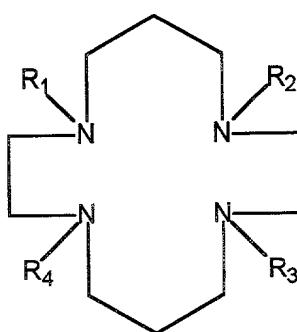
ABSTRACT

The invention relates to the preparation of novel therapeutically active polyamines, such as derivatives of 1,3-bis-[2'-aminoethyl]-amino]propane (2,3,2-tetramine) and 1,4,8,11-tetraazacyclotetradecane (cyclam), optimization of their mechanistic and bioavailability characteristics, so these compounds can be used in the treatment of Parkinson's disease, Alzheimer's disease, Lou Gehrig's disease, Binswanger's disease, Olivopontine Cerebellar Degeneration, Lewy Body disease, Diabetes, Stroke, Atherosclerosis, Myocardial Ischemia, Cardiomyopathy, Nephropathy, Ischemia, Glaucoma, Presbycussis, Inherited Mitochondrial Neuropathies and Myopathies and Cancer.

Accordingly, in one aspect the invention is directed to compounds of the formula:



or



wherein

R₁ and R₂ may be the same or different and are hydrogen, alkyl, aryl, cycloalkyl, amino acid, glutathione, uric acid, ascorbic acid, taurine, estrogen, dehydroepiandrosterone, probucol, 5 vitamin E, hydroxytoluene, carvidol, α -lipoic acid, α -tocopherol, ubiquinone, phylloquinone, β -carotene, meanadione, glutamate, succinate, acetyl-L-carnitine, co-enzyme Q, lazeroids, polyphenolic flavonoids, homocysteine, menaquinone, idebenone, dantrolene – (CH₂)_n[XCH₂)_n]NH₂ - wherein n = 3-6 and X = nitrogen, sulfur, phosphorous or carbon, or heterocycle wherein R₁ and R₂ taken together are –(CH₂XCH₂)_n- wherein n = 3-6 and X = 10 nitrogen, sulfur, phosphorous or carbon.

R₃ and R₄ may be the same or different and are hydrogen, alkyl, aryl, cycloalkyl, amino acid, glutathione, uric acid, ascorbic acid, taurine, estrogen, dehydroepiandrosterone, probucol, vitamin E, hydroxytoluene, carvidol, α -lipoic acid, α -tocopherol, ubiquinone, phylloquinone, β -carotene, meanadione, glutamate, succinate, acetyl-L-carnitine, co-enzyme Q, lazeroids, polyphenolic flavonoids, homocysteine, menaquinone, idebenone, dantrolene or 15 heterocycle wherein R₃ and R₄ taken together are –(CH₂XCH₂)_n- wherein n = 3-6 and X = nitrogen, sulfur, phosphorous or carbon.

R₅ and R₆ may be the same or different and are hydrogen, alkyl, aryl, cycloalkyl, amino acid, 20 glutathione, uric acid, ascorbic acid, taurine, estrogen, dehydroepiandrosterone, probucol, vitamin E, hydroxytoluene, carvidol, α -lipoic acid, α -tocopherol, ubiquinone, phylloquinone, β -carotene, meanadione, glutamate, succinate, acetyl-L-carnitine, co-enzyme Q, lazeroids, polyphenolic flavonoids, homocysteine, menaquinone, idebenone, dantrolene – (CH₂)_n[XCH₂)_n]NH₂ - wherein n = 3-6 and X = nitrogen, sulfur, phosphorous or carbon, or 24

heterocycle wherein R_5 and R_6 taken together are $-(CH_2XCH_2)_n-$ wherein $n = 3-6$ and $X =$ nitrogen, sulfur, phosphorous or carbon.

M , n , and p may be the same or different and are bridging groups of variable length from 3-12 carbons.

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X_1 and X_2 may be the same or different and are nitrogen, sulfur, phosphorous or carbon.

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